ordinary demands which are often made upon their strength and endurance.

No one is quicker to recognize a falling off in ability or a tendency to grow "stale" as it is termed, than a skilful trainer who has his men under more or less constant observation. Like an experienced horseman, he may not know the physiological or pathological condition of the animal, but he does know almost by intuition when he is fit or not fit for the race-course.

In this respect, the physician, unless he has had a similar experience may better leave these matters to the judgment and discretion of the physical trainer.

Where the medical student can best apply his time and energies is in increasing his knowledge of the being to be trained, and in trying to enlighten the general public as to the real significance of the term education. According to our best thinkers, it is no longer a matter of mere literary training. To quote from Dr. Youmans: "Education is an affair of the laws of our being, involving a wide range of considerations, an affair of the air respired, its moisture, temperature, density, purity and electrical state; an affair of food, digestion, and nutrition; of the quantity, quality and speed of the blood sent to the brain; of clothing and exercise, fatigue and repose, health and disease, of variable volition and automatic nerve action; of fluctuating feeling, redundancy and exhaustion of nerve power; an affair of light, color, sound, resistance; of sensuous impressibility, temperament, family history, constitutional predisposition, and unconscious influence; of material surroundings, and a host of agencies which stamp themselves upon the plastic organisms, and reappear in character; in short, education involves that complete acquaintance with corporeal conditions which science alone can give."

In the bubbling, seething condition of education at the present day, I know of nothing upon which true progress is more dependent, than upon a realizing sense of these important facts, and a just recognition of the unity of the human organism, and the absolute necessity of training mind-body and body-mind as the essential parts of a perfect whole.

Descartes has well said: "If it is possible to perfect mankind, the means of doing so will be found in the medical sciences." In attempting to bring about this "dual league" between mind and body as a matter of education, no class in the community have it within their power to do a nobler service for their fellowmen than the medical students and the medical practitioners.

SLIPPING PATELLA.[1]

BY E. H. BRADFORD, M.D.

THIS affection has received but little attention in surgical literature, although it is not of great rarity and may occasion a great deal of discomfort.

The following cases may serve as illustrations:

CASE I. A healthy girl of fourteen presented herself for advice with a slight effusion in the left knee. She stated that a few weeks before, her patella had slipped to the side, had been replaced after twisting the limb. Considerable pain had followed, and some swelling at the knee, obliging her to remain quiet for a few days. There was at the time of examination slight effusion in the left knee, but nothing else could be observed. The patella floated, owing to the presence of fluid in the joint and could be pushed to either side. A retention appliance was used, and massage and electricity advised. The treatment was carried out faithfully, but in the subsequent history given, there were occasional attacks of a similar nature, in case the strap was laid aside or worn loosely. The case was followed for twelve years. The knee became gradually stronger and the patella, after the patient grew to adult life, was dislocated but rarely, not oftener than once in a year. The retention appliance was worn for a year and finally discarded. The limb never, however, became as strong as the other, and some muscular atrophy followed the use of the appliance. The disability, however, was not sufficient to cause more than a passing annoyance.

CASE II. A young man of twenty dislocated his patella while dancing and was brought to the hospital, where the patella was reduced under an anesthetic. The subsequent history of the case is not known.

CASE III. A woman of twenty-five, in poor health, presented herself with the statement that she had for years been annoyed by the occasional slipping of the patella of both knees. The attacks did not occur more frequently than once in a few months, and were not followed by synovitis or effusion, but were sufficiently annoying to interfere with her occupation, that of a domestic, and gave her a sense of insecurity.

CASE IV. A healthy young lady of twenty-two complained of occasional attacks of slipping patella of the left leg. The attacks were not sufficiently frequent to cause her great annoyance, though they occasioned a sense of insecurity.

CASE V. A nurse (a woman of thirty-seven) had suffered for years from a slipping patella. Nothing could be discovered on examination of the knee except a weakness of the extensor cruris muscles. The patient was placed under the care of Dr. Douglas Graham, who took charge of massage and muscular development to the great benefit of the patient.[2]

CASE VI. A rapidly growing girl of thirteen suffered great annoyance by frequent attacks of slipping of the patella of the right leg. These attacks were accompanied by considerable pain, great distress; and although the deformity corrected itself in a few seconds, it was accompanied by a sense of weakness and disability, so great that the patient was in constant apprehension. The patella was secured in place by means of a supporting appliance, which has been worn for three years. In addition to this, massage and electricity have been employed. The patient has gained in strength, and at present has been freed from any attacks of slipping patella for a year. The muscles, however, of that limb about the knee are smaller than on the other side.

CASE VII. A child of eight presented herself at the hospital suffering from congenital dislocation of the left hip for which she underwent Hoffa's operation. On examination it was found that she was able to dislocate her right patella at will. This could be done only when the leg was bent at the knee. It is accompanied by a slight twist of the tibia outward. No pain was occasioned by this. The bony ridge on the outer side of the articulating surface of the femur with the patella could be distinctly felt as normally developed. The child was delicate and with feeble muscles.

[1] Presented at the Annual Meeting of the American Orthopedic Association, Chicago, September 17, 1896.

[2] Douglas Graham: Treatise on Massage, page 279.

The foregoing cases illustrate the fact that the affection is more common in girls and women than in men or boys; that the attacks of dislocation of the patella are, as a rule, accompanied by little pain, but by a great sense of discomfort. Although occasionally some effusion follows an attack, this is by no means constant. As a rule, the patella can be replaced by the patient with proper movements of the limb, but at times this is accompanied by pain. Sometimes an anesthetic is necessary. In none of the instances here mentioned was there any noticeable lengthening of the ligamentum patellæ mentioned by Dr. Newton Schaffer. After many attacks of dislocation, the patient complained of a sense of insecurity in walking, which in severe cases may amount to a distressing disability, limiting the patient's ability to walk or engage in active occupation. The affection seems to be due more to a lack of tonicity of the extensor cruris muscles, especially of the lower fibres of the vastus internus, and probably also a laxity of the internal lateral ligaments, passing from the internal condyle to the patella and connected closely with the capsule. An examination of a large number of femora would suggest that an absence of the ridge between the outer condyle and the articulating surface for the patella on the anterior face of the femur is not the cause of a slipping patella. The fact that the accident takes place with a limb in a flexed position rather than in a straight position is perhaps due to the advantage which the fibres of the lower knee of the vastus internus have when the limb is slightly bent. If for any reason the lower fibres of the vastus internus are weakened, or the ligaments are less strong than normal, the patella could be pulled by violent muscular exertion to the outer side. The fact that the slipping is to the outside is perhaps due to the greater strain which comes upon the ligaments on the inner side from the habit of walking with the foot slightly turned out, and from the frequency of knock-knee in women.

MECHANICAL MEANS FOR SLIPPING PATELLA.

Devices for retention of a slipping patella are many. The elastic knee-cap which is frequently recommended will be found of little service, as it presses the patella downwards upon the femur without exerting pressure on the sides, not being moulded to fit the osseous contour. The knee-cap restrains slightly the motion of the limb; but after the elastic has become stretched from use, it is worse than useless, as the constriction of the muscles favors muscular atrophy. If, however, the elastic knee-cap is split in front and furnished with lacings which will allow its being secured at any required tension, and felt-pads are sewed upon the sides of the cap at such places as would exert pressure upon the sides of the patella, an arrangement is furnished which when properly adjusted will give a serviceable support in lighter cases, allowing motion at the knee.

A more efficient and less comfortable support can be made by taking a cast of the limb and upon this moulding a leather knee-cap, which can be laced about the lower thigh, knee and leg. This restricts bending at the knee and exercises side pressure upon the patella, and therefore prevents its slipping. It is not, however, curative, and favors the development of atrophy, but is of value after a severe attack followed by effusion.

A steel appliance will be found to be of service if made of two uprights, hinged at the end, extending from the middle of the calf and the middle of the thigh on each side of the limb, and connected with cross-pieces above and below. To these are attached, at the level of the middle of the patella semilunar plates, which are bent in such a way as to press upon the sides of the patella. They are covered with padding and leather. If diagonal leather straps pass from the uprights to button upon the top and bottom of these plates, an adequate amount of side pressure will be secured. Two straps from underneath the knee prevent the apparatus from falling forward, and the diagonal straps mentioned prevent the apparatus from slipping backwards. It is essential that this appliance should not remain in a bent position. To prevent this, a spring is furnished connecting the upper portion of the upright with the lower portion, and with sufficient strength to force the appliance into a straight position. This appliance is somewhat heavy.

MASSAGE AND ELECTRICITY.

It is manifest that all treatment by appliances must be simple in character, and that no cure can take place except through the development of the muscles or alteration in the strength or length of the ligament. In certain cases, reliance can be had upon the natural development in the growth of the patient, and it is simply necessary during the growing period to prevent the ligaments from the additional strain of a frequently displaced patella.

OPERATIVE MEASURES.

Bajardi[3] describes an operation which he performed upon a congenital dislocation of the patella in a child of four, where dislocation of the patella could be produced at will and without pain.

November 25, 1892, Bajardi excised a semilunar piece of the internal capsule ligaments, and sutured the cut edges. His patient is reported as cured. He has collected thirty-four cases of congenital dislocation of the patella, but none of these were operated upon.

Dr. Gavin of Boston, in an unreported case, shortened the lateral capsular ligaments; and I am informed that this has also been done by Dr. Perkins of Kansas City in a case of traumatic dislocation of the patella.

In the following case operative interference seemed justified. Patient, a healthy young lady, has suffered from slipping patella since the age of thirteen. Various methods of treatment had been thoroughly tried; gymnastics, massage, electricity and an apparatus had all been employed with thoroughness. By the means of proper appliances the patella had been retained in place for a long time; but on any loosening of the apparatus or knee-cap, slipping of the patella was likely to occur, the annoyance and apprehension limiting the patient's activity seriously, as both knees were affected, interfering with the ordinary enjoyments and occupations of life. Through the courtesy of Professor Dwight, experiments were made upon cadavers to determine the best incision to allow the shortening of the capsular ligaments on the inner side of the knee, and also a possible transplantation of the ligamentum patellæ, or shortening it in case it was found lengthened. March 6th both knees were oper-

[3] New York Medical Record, April 20, 1895.

ated upon. A semilunar incision was made along the inner side of the knee a half-inch anterior to the tubercle of the internal condyle. The upper end of the incision extended three inches upward and the lower portion curved so as to pass from the ligamentum patellæ at its insertion on the tubercle. The ligamentum patellæ was found half an inch longer on the left side than on the right. It was also thinner than normal; it was therefore divided by means of an oblique incision passing from without inwards and downwards. No attempt was made to free the ligaments from the capsule of the joint, but a curved incision was made upon the condyle, of sufficient depth and extent to allow seizing the cut ligament by means of forceps and pulling the patella to the side; this was done without opening the joint, the serous surface of the synovial sac not being interfered with. The divided portion of the outer tissues forming the capsule and containing the ligaments were drawn to the inside by means of forceps and stitched a half-inch nearer to the condyle. The patella was forced down by the hands of an assistant and the divided ligamentum patellæ stitched in such a way that the lower edge on the inner side was secured a half-inch lower to the aponeurosis and the inner side, and slightly below the top of the tubercle of the patella. The remaining portion of the obliquely incised ligament was stitched to the corresponding portion of the lower cut edge of the ligament in such a way that the upper portion was slid one-half inch downward; the free portion of the lower cut edge was sewed to the side and top of the ligament so as to reinforce its strength. The sutures were both of catgut and silk. Skin was sewed with uninterrupted sutures. On the right leg the ligamentum patellæ was found to be less long and less thin. The patella was pressed to the inside by the hand of an assistant, the loose capsular tissue was folded upon itself, and a pleat sewed at the side half-way between the patella and the internal condyle. After the proper aseptic dressing the limb was secured in plaster-of-Paris bandages.

The operative recovery was uneventful. On removal of the plaster bandages, lace leather supports were applied and the patient allowed to stand on crutches. On removal of the leather supports, straps were used to prevent a possibility of the slipping of the patella. This was secured by means of a pad consisting of a large rubber tube, stitched to a piece of leather and placed at the outer side of the patella, being long enough to extend slightly beyond the patella. This was secured in place by means of a strip of adhesive plaster, which passes under the thigh and leg obliquely. At each end of the leather a buckle was placed, and to this webbing straps could be attached. These webbing straps were fastened to elastic webbing and passed obliquely around the thigh above the leg and below, and fastened to the waistband and the shoe. When the webbing straps were buckled firmly, the rubber pad was pressed securely against the outer side of the patella, and any requisite pressure could be secured, slipping to the outside being impossible. The patient was allowed to walk first with crutches, then with a cane, then discarding the cane; the left leg was kept stiff by the use of a leather appliance for two months. All appliances were discarded from the right knee three months after the operation, and five months after from the left knee. Ten months after the operation the patient appeared entirely well, and has improved in strength and agility, and has been entirely free from any slipping of either patella.

The operative treatment of this disability recommends itself as easy of execution and free from danger, and is of advantage in all cases where the disability is not remedied by conservative treatment. Where it is possible to take a fold in the capsule without opening the joint, it is certainly advisable to do so. The transplantation or shortening of the ligamentum patellæ will not be necessary except in the severer cases, but it will be found that it can be done without opening the joint and without any serious danger.

ANALYSIS OF EIGHT HUNDRED CASES OF ASTIGMATISM WITH REGARD TO THE DIRECTION OF THE PRINCIPAL AXES.

BY HENRY W. KILBURN, M.D.,
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IT was long ago noticed that, in the majority of astigmatic eyes, the vertical meridian of the cornea is more sharply curved than the horizontal, or, in other words, is the one having the greater refraction. The axis of the correcting cylindrical glass for such an eye must, therefore, be vertical if the astigmatism is hypermetropic, and horizontal if the astigmatism is myopic. If the horizontal meridian is found to be the one of greater refraction, the astigmatism is said to be "against the rule."

In a very large number of astigmatic eyes, the meridian of greater refraction is not exactly vertical or horizontal, but deviates from one or the other of these directions, quite often to a considerable extent. In this article I have considered all cases "against the rule" in which the axis of the correcting cylindrical lens deviated 45° or more from the horizontal in myopic astigmatism, or 45° or more from the vertical in hypermetropic astigmatism.

Opinions vary so much as to the proportion of astigmatisms with and against the so-called "rule" (some observers having even gone so far as to doubt the existence of one), that I thought it would be interesting to examine the records of cases in my own practice, in order to obtain statistics from them. I have examined the records of 800 consecutive cases of astigmatism, — they are not *selected* cases. In these 800 cases, there were 1,485 astigmatic eyes, a number which seems to me large enough to render statistics of considerable value. I first went over the records to see in how many eyes the astigmatism was *with* the rule and in how many *against* it. The results I have tabulated as follows:

Number of astigmatic eyes	1,485
Hypermetropic astigmatism	1,040
" " with rule	815
" " against rule	225
Myopic astigmatism	445
" " with rule	307
" " against rule	138
Astigmatism (both kinds), with rule	1,122
" " against rule	363

Or, by percentage —

Hypermetropic astigmatism, with rule	78.4%
" " against rule	21.6
Myopic astigmatism, with rule	69.
" " against rule	31.
Astigmatism (both kinds), with rule	76.
" " against rule	24.